REMARKS

Claims 1, 7, 13 and 20-25 are presently pending in the application. Claims 2-6, 8-12 and 17-19 have been cancelled without prejudice, and new claims 20-25 have been added. Claims 1 and 13 have been amended. No new matter has been added and support for the amendments to the claims can be found in the specification and drawings. It is respectfully submitted that the amended claim language "route *signals* from a plurality of in-ports..." overcomes the outstanding Section 112 rejection of Claim 1 in the parent application. In view of the foregoing amendments and argument hereinbelow, Applicants respectfully submit that claims 1, 7 and 13 are in condition for allowance.

Claim Rejections -- 35 U.S.C. § 103(a)

Claims 1 and 7 presently stand rejected under Section 103(a) in the parent application (U.S. Appl. Serial No. 09/641,083) as being unpatentable over either Doucet et al. U.S. Pat. No. 5,786,923 ("Doucet"), or Willebrand U.S. Pat. No. 6,239,888 ("Willebrand"). Applicants respectfully submit that neither of these references teach or suggest the claimed invention.

As set forth in Claim 1, as amended, an aspect of the present invention provides a communications system comprising a plurality of nodes, *where each node* includes an optical switch to controllably route signals from a plurality of in-ports of the optical switch into a plurality of out-ports of the optical switch. A plurality of point-to-point links *between each node and another of the plurality of nodes* interconnect the plurality of nodes into a network. Each point-to-point link includes a free space optical channel, where a first free space optical channel couples to a first node through a receive path and through a transmit path. The receive path couples to a respective in-port of the optical switch of the first node, and the transmit path couples to a respective out-port of the optical switch of the first node.

The Examiner contends:

> Doucet et al., in Fig. 4 discloses a communications system comprising a plurality of nodes (shown in Fig. 1); optical switch (889); and a plurality of point to point links (Transceivers shown in Fig. 4)

> Similarly, Willebrand in Fig. 6 discloses a communication system comprising a plurality of nodes (shown in Fig. 1); optical switch (80); and a plurality of point-to-point links (30).
>
> The above references fail to teach or suggest a switch for each node. The references teach a single switch for a plurality of nodes. . . . it would have been obvious . . . . to use a switch in each node, since it has been held that the mere duplication of the essential working parts of a device involves only routine skill in the art. Office Action at page 3, ¶6 – page 4.

With regard to Doucet, Fig. 4 discloses a preferred embodiment of an optical router 110 (depicted in Fig. 1), that routes data to subscriber transceiver units 130 that are located at subscriber premises. See Col. 4, lines 21-26. As shown in Fig. 1, the optical router 110 routes data between a primary transceiver unit 120 and each of the subscriber transceiver units 130 to establish a channel of communication with each subscriber transceiver unit 130. Doucet at Col. 5, lines 30-32. This forms a "point-to-multipoint wide area telecommunications network." Doucet at Col. 5, lines 60-61. This is completely different from what is being claimed in the present invention.

Claim 1 relates to a metro grid comprising a plurality of nodes that are "typically located on the top of buildings, or on the outside walls of buildings in metropolitan areas and on towers elsewhere. See Specification at page 4, lines 3-6. Each *node* enables a *plurality of point-to-point links* to be established between a node and another of the plurality of *nodes*. Doucet contains no teaching or suggestion of joining a plurality of nodes in a network a claimed. With regard to the "switch" 889 cited by the Examiner and depicted in Fig. 4 of Doucet, that component is part of an optical router assembly that establishes communication paths between a single point and a plurality of endpoints (subscriber transceivers 130). As described in Doucet:

> The optical router 110 comprises a secondary transceiver unit 700 coupled to a plurality of transceiver modules 800A-800M

> (referred collectively as 800) by an electronic router 790. The transceiver modules 800 are coupled to a circular backplane 889. The electronic router 790 is coupled to the transceiver modules 800 through the backplane 889. Col. 9, lines 27-35.

Thus, it is clear that the "switch 889" operates to couple a plurality of router components (modules 800) to an electronic router 790 that is part of the router assembly 110. This is different from an optical switch that is part of a *node* for establishing point-to-point links as claimed. Furthermore, Doucet specifically distinguishes his invention from a system having point-to-point links as follows:

> Additionally, the present invention advantageously provides a much less expensive telecommunications network *than a network which employs an array of point-to-point atmospherically transmitted light beams*. Col. 6, lines 1-4 (emphasis added).

Accordingly, it is respectfully submitted that the Examiner's contention that "mere duplication of essential working parts of a device involves only routine skill in the art" is misplaced, since Doucet explicitly teaches away from the claimed system of a plurality of nodes where each node has an optical switch to controllably route signals from a plurality of in-ports of the optical switch into a plurality of out-ports of the optical switch so that a plurality of point-to-point links interconnect the plurality of nodes into a network.

With regard to Willebrand, Fig. 6 of that reference shows a "point-to-multipoint" arrangement analogous to the system disclosed in Doucet as discussed above. The optical switch 80 is part of a router (station 22*b*) that routes signals received from fiber links 26*e* and 26*f*, to a plurality of stations 22*i* over free space links 24 and vice versa. The optical switch 80 also routes signals originating at a transmitting station 22*i* and received at station 22*b*, to another one of the stations 22*i*. See Willebrand at Col. 9, lines 42-60. This is completely unrelated to the claimed structure. There is no teaching or suggestion here of establishing a *plurality of point-to-point links* between a node and another of a plurality of nodes as called for in claim 1 of the present invention.

In view of the above, it is respectfully submitted that claims 1 and 7 (which depends on claim 1) are patentable over either Doucet or Willebrand.

Claim 13 stands rejected under Section 103(a) as being unpatentable over Rutledge U.S. Patent No. 5,844,705 ("Rutledge"). Applicants respectfully traverse this rejection and submit that Rutledge fails to teach or suggest the claimed invention.

In accordance with an aspect of the present invention, claim 13 as amended, calls for a communication hub including "a plurality of neighborhood links to *corresponding users where each link carries an optical signal having a wavelength assigned to a corresponding user.*" This is referred to as "pole to home" wide distribution local service. Specification at page 11, line 30. In an exemplary embodiment depicted in Fig. 6 of the patent application, multiplexed signals are received from a network over a free space optical link 112 or optical fiber cables 114. These signals are demultiplexed at a wave division multiplexer/demux (WDM) or dense wave division multiplexer/demux (DWDM coupler 120. An electro-optical switch 60 routes the demultiplexed optical signals of an appropriate wavelength to homes 102 (a plurality of neighborhood links λ_1, λ_2, λ_3 . . . λ_n to corresponding users) using free space optical channel (FSOC) telescopes. See Specification at page 11, lines 10-27. In the reverse direction, signals from the homes are multiplexed at coupler 120 and then travel back to the network over the free space optical link 112 or optical fiber cables 114.

The Examiner contends:

> . . . Rutledge in Fig. 1 discloses a communication hub comprising a plurality of neighborhood links (52); a switch (70, 90); and a trunk (60). The only difference between the claim and the reference is the switch in Rutledge in not an optical switch. Nevertheless, since the use of [an, sic] optical switch in [a, sic] communication hub is well known in the art (see the Doucet and Willebrand references for example), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an optical switch in Rutledge (as needed) in order to realize

the advantage of efficient switching. Office Action at page 4, ¶7.

Applicants respectfully disagree. The structure disclosed in Fig. 1 of Rutledge subdivides a conventional cell 20 in a wireless communications system 10 into a plurality of smaller subcells 40*a-d*. Each of subcells 40*a-d* is served by a respective antenna 50*a-d* that communicates with a central antenna 30 over optical links 32*a-d* and 52*a-d*. This is completely unrelated to the invention of claim 13, which has nothing to do with subdividing the cells of a wireless communications system. The switches 70 and 90 that the Examiner refers to are the mobile switching office (MSC) 70 and the telephone company switching equipment 90. See Rutledge at Col. 2, lines 52-55. Thus, even assuming *arguendo* that one could somehow substitute an optical switch for the telephone company switching equipment as asserted by the Examiner, this configuration still would not provide a communication hub that enables a "plurality of neighborhood links to corresponding users" as claimed. Not only does this fail to reach the claimed invention, such a combination would render Rutledge inoperable. Furthermore, there is nothing in Rutledge that suggests "a trunk coupled between the optical switch and a free space optical channel link to a network" as claimed. The optical links disclosed in Rutledge relate to communications between the central antenna 30*a* and the individual antennas 50*a-d* that subdivide the conventional cell 20 into a plurality of subcells 40*a-d*. Accordingly, it is respectfully submitted that Claim 13, as amended, is patentable over Rutledge and that this Section 103 rejection is improper.

New claims 20 and 21, which are dependent on claim 13, relate to an aspect of the present invention wherein the neighborhood links further include an optical fiber link to carry multiplexed signals from the communication hub to a remote multiplexer/demultiplexer if homes served by the communication hub are located too far away to be provided service over free space optical links from the hub. See Specification at page 11, lines 17-21 and Fig. 6.

New claims 22-25 cover an aspect of the invention where the communications hub of claim 13 is combined with the network of claim 1.

In view of the foregoing, it is submitted that Claims 1, 7, 13 and 20-25 are in condition for allowance.

The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. 1.16 or 1.17 to AT&T Corp. Account No. 01-2745. The Examiner is invited to contact the undersigned at (201) 224-7957 to discuss any matter concerning this application.

Respectfully submitted,
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